The Advantage of Contrast-enhanced Helical Computed Tomography in the Diagnosis of Arterio-enteric Fistula in an Elderly Patient

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Arterio-enteric fistula is a rare but critical cause of gastrointestinal bleeding. Most of the cases in the literature resulted from complications of aortoiliac surgery[1]. A few cases developed in patients who had pelvic irradiation[2] or non-Hodgkin's lymphoma[3]. Very rarely, the fistula occurred in patients with advanced ovarian cancer[4]. We report a case of advanced ovarian cancer with gastrointestinal bleeding caused by a rare arterio-enteric fistula that was initially overlooked on angiography but correctly diagnosed on contrast-enhanced helical computed tomography (CT), which seems to be a useful tool for detecting unusual bleeders and is usually available in the emergency room.

A 66-year-old female presented to our emergency department because of continuously massive anal bleeding. She was diagnosed with a stage IIIc ovarian adenocarcinoma with peritoneal carcinomatosis 2 years prior to this admission. She had received maximal debulking surgery and six cycles of chemotherapy. Upon arrival, her body temperature was 37.9°C, pulse rate was 156 beats/min, respiratory rate was 24 breaths/min, and blood pressure was 40/31 mmHg. Laboratory data showed a hemoglobin level of 6.7 g/dL and a white cell count of 17,200/mm^3 with a left shift. Prolonged prothrombin time and partial thromboplastin time were noted. The patient received fluid resuscitation, a blood transfusion, and empirical antibiotics. After stabilization of her vital signs, she underwent an emergency angiography in which no active bleeder was identified from the gastroduodenal artery, superior mesenteric artery or inferior mesenteric artery. A pelvic angiography showed an aneurysm in the left external iliac artery but without evidence of bleeding (Figure A). Despite medical stabilization, the bleed from the lower gastrointestinal tract persisted. A contrast-enhanced helical CT of the abdomen was subsequently performed in which a pooling of contrast material from the left external iliac artery was also seen (Figure B). This abnormal pooling of contrast material then drained into the sigmoid colon (Figure C). Owing to suspicion of an arterio-enteric fistula between the left external iliac artery and sigmoid colon, an emergent operation was performed. The surgical ligation was successful; however, a massive amount of infected bloody ascites was found. Two months after admission, she died of sepsis and multiple organ failure despite aggressive treatment.

The predominant causes of lower gastrointestinal bleeding are diverticulitis, ischemic colitis, hemorrhoids, and arteriovenous malformations[5]. Poor control of active hemorrhage occurred in 37% of patients, and the mortality rate due to rebleeding could be as high as 3.5% of all cases of lower gastrointestinal bleeding[5]. It is known that mortality rates are increasing in cases of elderly patients, severe comorbidity or rebleeding[6]. A case of arterio-enteric fistula has recently been reported in a patient with non-Hodgkin's lymphoma who was treated with chemotherapy[3]. Therefore, anticancer chemotherapy should be considered as another possible etiology that may cause arterio-enteric fistula. Most of these patients are elderly and physiologically compromised with multiple comorbid conditions[7].

Some surgical literature has suggested that the examination would be difficult to perform in the acute setting because of the massive amount of intraluminal

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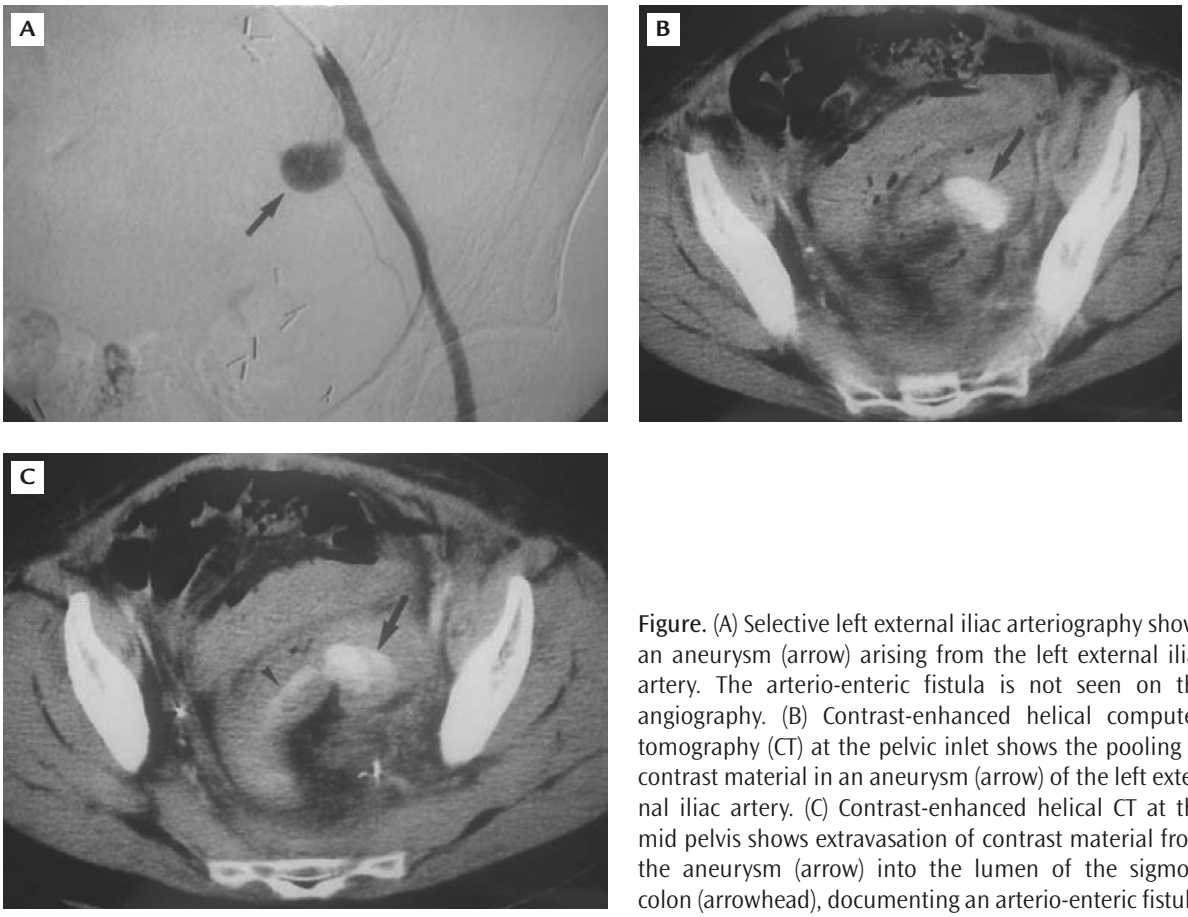

Figure. (A) Selective left external iliac arteriography shows an aneurysm (arrow) arising from the left external iliac artery. The arterio-enteric fistula is not seen on the angiography. (B) Contrast-enhanced helical computed tomography (CT) at the pelvic inlet shows the pooling of contrast material in an aneurysm (arrow) of the left external iliac artery. (C) Contrast-enhanced helical CT at the mid pelvis shows extravasation of contrast material from the aneurysm (arrow) into the lumen of the sigmoid colon (arrowhead), documenting an arterio-enteric fistula.

blood clotting and lack of patient cooperation[8]. In this situation, helical CT is the preferred choice of modality in assessing acute lower gastrointestinal bleeding after stabilized hemodynamic condition, especially in the elderly patients. Unfortunately, the mesenteric angiography did not show any obvious bleeder in this patient except an external iliac aneurysm. The first limitation of angiography is that slow gastrointestinal bleeding at a rate of <2 mL/min is not detected by angiography[9]. The second limitation is that if the bleeder is a fistula from a remote artery that is not catheterized, the chances that it will be overlooked are great. In this case, although an external iliac aneurysm was found on the angiography, it was not thought to be the source of bleeding because it was a rounded lesion without any contrast material extravasation. Most of the patients with this finding on CT can be hemodynamically stable at the time of CT but may deteriorate afterwards. By reviewing the published data, arterial phase helical CT scanning is shown to be an excellent diagnostic tool for fast and accurate detection and localization of acute gastrointestinal bleeding. It can be performed without time-consuming patient preparation during the hemorrhagic episode[10]. Therefore, contrast-enhanced helical CT has a high value of detecting potentially hemorrhage and has implications for early and specific treatment. In this case, the contrast-enhanced helical CT accurately depicted the site of active gastrointestinal bleeding. Furthermore, CT also clearly delineated the fistula tract between the left external iliac artery and the sigmoid colon. The results of selective mesenteric angiography would be negative in patients with lower gastrointestinal bleeding arising from an arterio-enteric fistula. In addition, helical CT seems to be a useful tool to detect unusual bleeders, especially in the elderly group, and is usually available in the emergency room[11].

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